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ARCHAEOLOGICAL EVIDENCE OF ABORIGINAL CULTIGEN USE IN LATE NINETEENTH AND EARLY TWENTIETH CENTURY DEATH VALLEY, CALIFORNIA

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ABSTRACT.—During archaeological test excavations in two rockshelters in Death Valley, California, two storage features were unearthed which were found to contain numerous perishable artifacts and foodstuffs. In addition to seed remains of indigenous species, including mesquite and piñon, several seeds of introduced cultigens were recovered from within the features, including melon, squash, and beans. The feature containing the greatest number of domesticate seeds appears to date to the late nineteenth and/or early twentieth century and represents the first reported archaeological evidence of Shoshoni horticulture in the southwestern Great Basin.

RESUMEN.—Durante excavaciones arqueológicas preliminares en dos refugios de roca en el Valle de la Muerte, en California, se descubrieron dos almacenamientos que resultaron contener numerosos artefactos y alimentos perecederos. Además de restos de semillas de especies nativas, incluyendo mezquite y piñón, se encontraron dentro de los vestigios varias semillas de cultivos introducidos, incluyendo melón, calabaza y frijol. El almacenamiento que contenía el mayor número de semillas domesticadas parece datar de finales del siglo diecinueve y/o principios del siglo veinte, y representa la primera evidencia arqueológica reportada de horticultura shoshoni en el suroeste de la Gran Cuenca.

RÉSUMÉ.—Des reconnaissances archéologiques conduites dans deux abris rocheux de la Vallée de la Mort en Californie ont permis de mettre au jour deux structures d'entreposage contenant plusieurs objets et denrées périssables. Outre des vestiges de graines d'espèces indigènes, incluant des graines de prosope et de pignon, plusieurs graines de cultigènes introduits ont été repérés dans les structures, provenant entre autres de melon, de courge et de haricot. La structure contenant le nombre le plus élevé de graines domestiquées semble dater de la fin du 19e et/ou début 20e siècle et représente la premièr évidence archéologique consignée d'horticulture shoshone dans la partie sud-ouest du Grand Bassin.

During the summer of 1992, archaeological test excavations were undertaken at two rockshelters (CA-Iny-272) in Breakfast Canyon, Death Valley National Park, California. The work was carried out by archaeologists from the Cultural Resource Facility (CRF) at the California State University, Bakersfield, under the supervision of the author. The CA-Iny-272 site is located on the north side of an east/west trending wash forming a northern side branch of Breakfast Canyon approximately 2.4 km (1.5 mi) southeast of Furnace Creek Ranch in central Death Valley (Figure 1). Fluvial activity in Breakfast Canyon resulting from winter storms earlier that year had resulted in the undercutting and collapse of the cultural deposit in one of

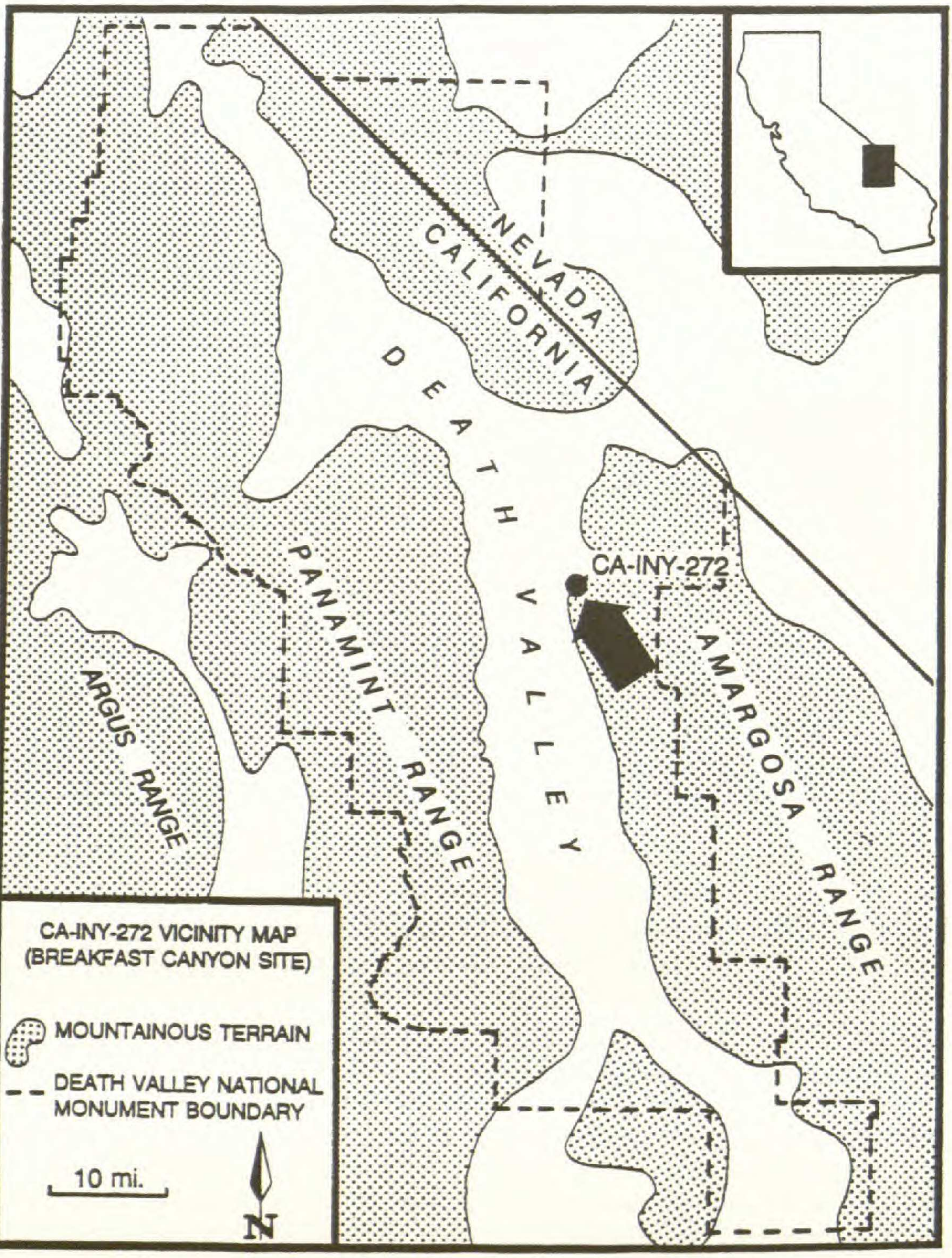

FIGURE 1.—CA-Iny-272 vicinity map including former Death Valley National Monument boundaries (Death Valley became a National Park in 1992)

the rockshelters. This event exposed numerous pieces of basketry and a clear stratum of organic material that caught the attention of several visitors who were hiking through the canyon. The high visibility of the archaeological deposit coupled with Breakfast Canyon's increasing recreational use made it imperative to determine the extent and nature of the cultural materials within the shelters before further disturbances occurred. At the request of the National Park Service, the CRF archaeologists set forth to evaluate the site and to salvage information from the exposed cultural feature.

The archaeological excavations in the rockshelters resulted in the discovery of two complete food storage features that contained numerous basketry fragments, cordage, historic artifacts, and various food items, including pods of honey mesquite (*Prosopis glandulosa* Torr. var. *torreyana* [L. Benson] M. C. Johnston), piñon (*Pinus monophylla* Torr. and Frem.) nuts, and cultigens. Apart from the discovery of various cultigen seeds in a rock crevice in Butte Valley made by William Wallace in the 1950s (W. Wallace, personal communication, 1995), the Breakfast Canyon project is the first instance where horticultural products have been found in an archaeological context in Death Valley. The Breakfast Canyon investigations provided a unique opportunity to glimpse traditional Shoshoni food storage customs both prior to and following the introduction of horticultural practices. This paper provides both a description of the storage features and the evidence of horticultural products found within these features and a discussion of the implications of this study for understanding horticultural practices in the southwestern Great Basin.

SITE AND FEATURE DESCRIPTIONS

The Breakfast Canyon site consists of two small rockshelters (A and B) that occur 1.5 to 3 m above the base of the wash. Both are solution cavities in mudstone that overlay consolidated alluvial deposits. Shelter A, the largest of the two, is the westernmost shelter and is approximately 15 m wide and a maximum of 3 m deep. Ceiling height varies from 1.5 to 2 m (Figure 2). It was the eastern half of Shelter A where the outer margin of a storage feature was exposed when a portion of the

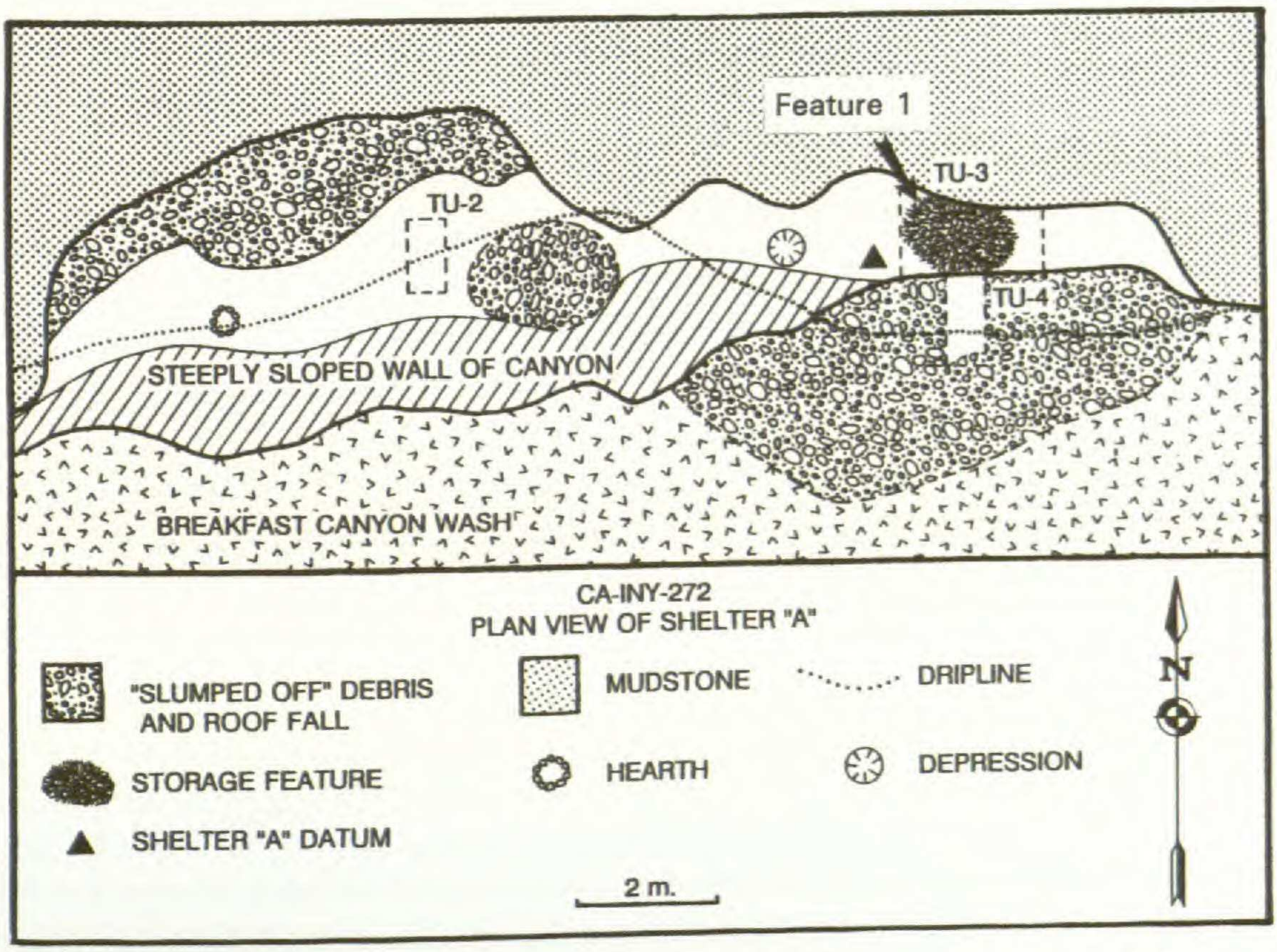

FIGURE 2. —Map of Shelter A showing the location of excavation units and the storage feature (Feature 1)

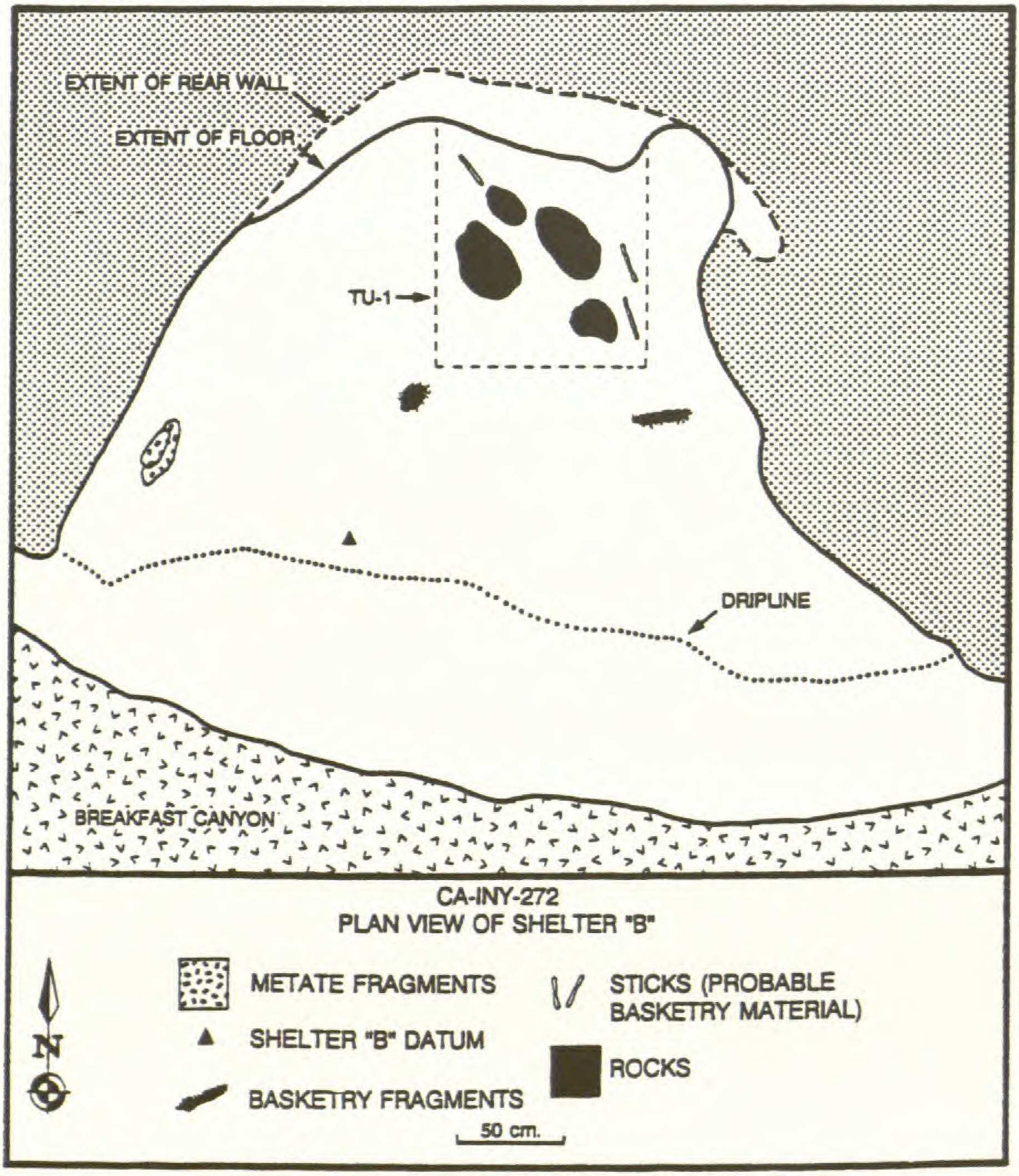

FIGURE 3. —Map of Shelter B showing the location of the one excavation unit (TU-1) where the historic cache pit was discovered (Feature 2)

cultural deposit collapsed. Shelter B, 26 m east of Shelter A, is much smaller, measuring 4 m in width and 2.5 m in depth (Figure 3). Two metate fragments and basketry were evident on the floor of the interior of this shelter prior to excavation.

Feature 1, the partially exposed storage pit in Shelter A, was further delineated through the excavation of a 2 x 1 m test unit (TU-3). The fully exposed feature was roughly circular and approximately 1 m in diameter and 70 cm in depth. Based on the discovery of an upper and lower component to the feature, it appeared that there were two distinct episodes in the use of the pit. This was later confirmed by radiocarbon analysis of floral materials (*Scirpus* sp. fragments) from each component. The upper component provided a "modern" ^{14}C date of 100 ± 70 B.P.

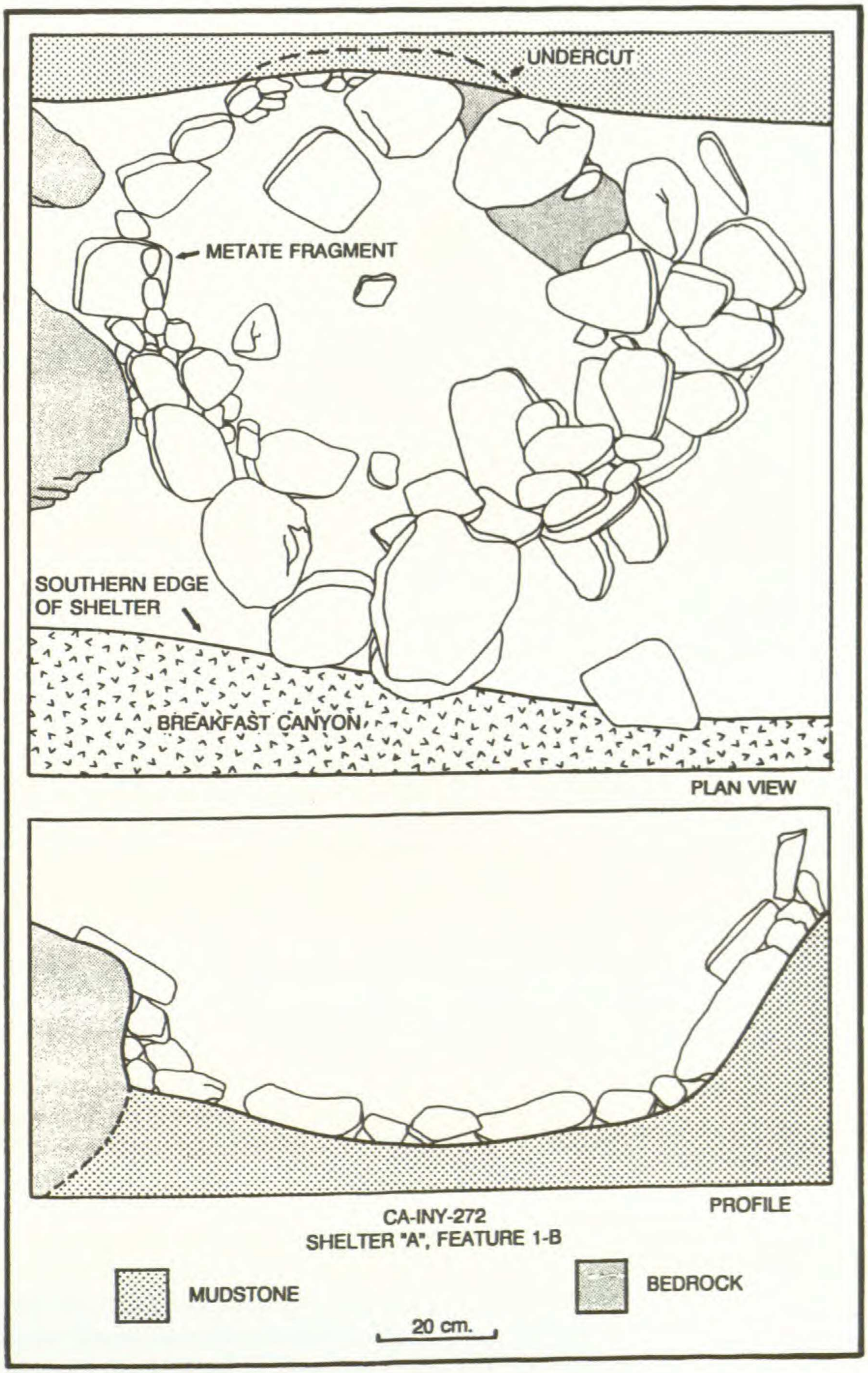

FIGURE 4. —Storage pit (Feature 1, lower component) from TU-3, Shelter A, CA-Iny-272

FIGURE 5. —Upper component of Feature 1, Shelter A (Photo by S. Valdez)

(Beta-54375), while the lower component dated to 340 ± 60 B.P. (Beta-54376).[1] Both components contained perishable artifacts and seeds, but only one domesticate, a squash/pumpkin (*Cucurbita* sp.) seed recovered from the upper component of Feature 1. The upper component of Feature 1 also contained two human coprolites, one of which contained piñon nut hulls and the other mesquite seeds, but neither contained identifiable cultigens. The earliest component of the storage pit was rock-and-clay lined (Figure 4), while the latest component was only grass-lined (Figure 5).

Feature 2, the storage pit in Shelter B, was demarcated on the surface of the rockshelter floor by several large rocks that suggested a deflated or partially removed cairn. A 1 x 1 m excavation unit (TU-1) bisected the storage pit which appeared to be slightly oval and estimated to be 1.5 x 1 m (Figure 6). Unlike Feature 1, there appears to have been only one episode of use of this pit. This feature contained numerous historic artifacts, including machine-made cotton cloth, cotton string, paper, a "silver" tablespoon, and a sardine can lid/base. Based on the age of the spoon (ca. 1891) and the sardine can fragment (post-1870), the feature appears to date to the late nineteenth/early twentieth century. The presence of an Old World date palm (*Phoenix dactylifera*) fruit seed from within the feature may suggest an even later date, given that fruit-producing date palms did not flourish in Death Valley until 1926 or 1927 (Gower 1970). This feature contained the greatest diversity of floral materials, including mesquite, piñon, cactus fruit, and various seeds from domesticated plants. The diversity of artifacts from within this storage feature was equally great. The inventory of cultural objects includes twined and coiled basketry, tule mats, a moccasin fragment, a bone chuckwalla hook barb,

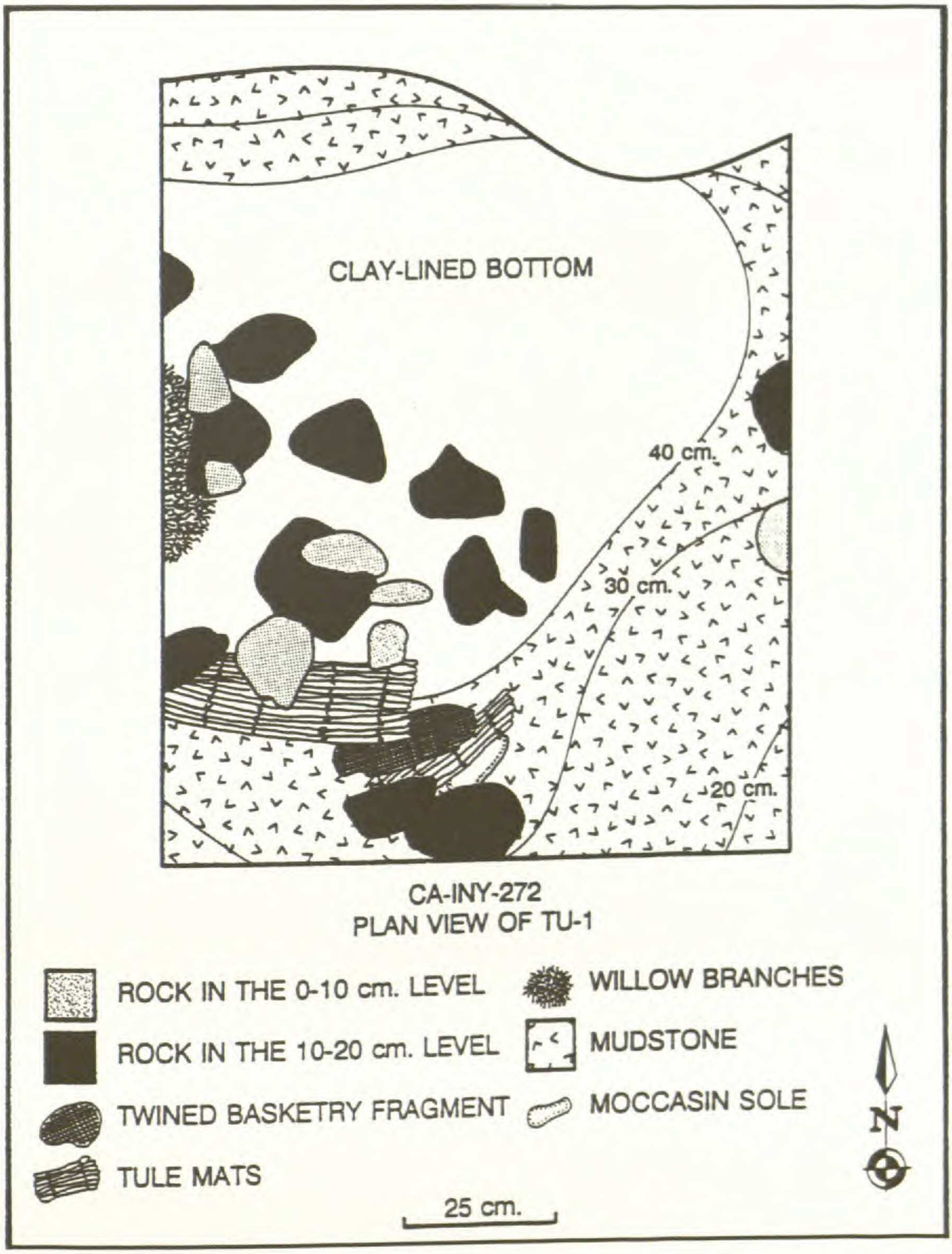

FIGURE 6. —Plan view of storage feature (Feature 2) from Shelter B, CA-Iny-272

and a Cottonwood Triangular projectile point with adhering mastic. A more complete description of the Breakfast Canyon site and artifacts can be found in Yohe and Valdez (1996).

FLORAL REMAINS

A large percentage of the contents of the storage features at CA-Iny-272 consisted of plant materials, much of which is believed to have functioned as padding

or lining of the storage features. These specimens were mostly in the form of fragments of wood, stems, and bark. Seeds and a small number of dried fruits comprised the remainder of the plant remains.

Table 1.—Identification of plant remains from CA-Iny-272

Shelter	*Taxon*	*Part*	*NISP*[1]
A, B	*Atriplex* sp.	wood	4
A, B	*Salix* sp.	wood	3
A, B	Asteraceae	wood	2
A, B	*Pluchea sericea*	wood	5
B	Monocot	stem	1
A, B	Cyperaceae, *Scirpus*-type	stems	84
A	Cyperaceae	stems	18
B	Poaceae (cf. *Phragmites*)	stems	6
B	Poaceae (Panicoid)	stem	1
B	Poaceae (Festucoid)	stems	—
B	Fabaceae	bark	73
B	cf. Liliaceae (*Yucca*?)	stem	1
B	*Opuntia* sp.	pad	3
B	Cactaceae	fruit	29

[1] Number of identified specimens

Woody materials and grasses.—A sample of floral material consisting of sorted plant fragments (n = 221) from both Features 1 and 2 was sent to PaleoResearch Laboratories in Denver, Colorado, for specific taxonomic identification through both microscopic morphological examination and analysis of phytoliths (Table 1). Common woody materials of the Shelter A feature (TU-3) include wood from saltbush (*Atriplex* sp.), arrowweed (*Pluchea sericea* [Nutt.] Colville), and willow (*Salix* sp.). The non-wood constituent of the pit lining was identified as a *Scirpus*-type sedge, as well as two other members of the Cyperaceae (Puseman and Scott-Cummings 1996).

Shelter B (TU-1) contained wood from *Atriplex*, possible arrowweed (*Pluchea sericea*), willow (*Salix* sp.), and a member of the Compositae (Asteraceae) family. Also identified were grass (Poaceae) stems with festucoid phytoliths, *Scirpus*-type stems, *Phragmites* sp. (reedgrass) stems, bean plant (Fabaceae) stems, and a possible Liliaceae (yucca?) stem. The presence of the legume stem is consistent with the presence of two tepary beans (*Phaseolus acutifolius* Gray) found within the storage feature.

All the plant materials incorporated into the features from both Shelters A and B would have been available either in the immediate vicinity of the shelters or at nearby springs, with the exception of the one possible yucca specimen. No member of the Liliaceae is indigenous to or currently found in Death Valley (Norris n.d.), but this family is commonplace (especially species of *Yucca*) in the Mojave Desert both south and west of the valley. Bulrush (*Scirpus olneyi* Gray) and willow (*Salix* sp.) probably would have been available at either nearby Travertine Springs or at the base of Furnace Creek Wash (the present location of Furnace Creek Ranch).

Seeds of domesticates.—A variety of cultigen remains were recovered from the Breakfast Canyon Shelters, all but one specimen coming from Feature 2 in Shelter B (Table 2). The most common domesticates were squashes and melons (*Cucurbita*

spp., *Citrullus vulgaris* Schrad., *Cucumis* sp., all of which are non-local), especially citron melon (*Citrullus vulgaris* var. *citroides* Bailey). One specimen of *Cucumis* was found in Feature 2, but it is not possible, based on seed characteristics alone, to differentiate between cantaloupe (*Cucumis melo* L.) and cucumber (*C. sativa*). Given the fact that cantaloupe ("musk melons") are known to have been cultivated by the Timbisha Shoshoni of Death Valley in historic times, it is likely that the seeds represent this plant. Four cucurbit seeds from Feature 2 could be either squash or pumpkin of three species (*Cucurbita maxima* Duch., *C. pepo* L., and *C. moschata*). Two other domesticates identified were tepary bean (*Phaseolus acutifolius*) and sorghum (*Sorghum bicolor* [L.] Moench.), the latter having been introduced from the Old World. The only domesticate found in Shelter A was a *Cucurbita* seed found in the upper component of Feature 1.

Table 2.—Seeds identified from Shelter B, CA-Iny-272

Common Name	Taxon	NISP[1]	Reported Use[2]
watermelon	*Cituillus vulgaris*	3	food
citron	*C. vulgaris* var. *citroides*	3	food
squash	*Cucurbita* sp.	4	food
cantaloupe?	*Cucumis* sp.	1	food
tepary bean	*Phaseolus acutifolius*	2	food
sorghum	*Sorghum bicolor*	1	food
date	*Phoenix dactylifera*	1	food
beaked spike rush	*Eleocharis rostellata*	1	none
phacelia	*Phacelia* spp.	3	medicinal
golden carpet	*Gilmania luteola*	1	none
blazing star	*Mentzelia* sp.	1	food
American tule	*Scirpus* sp.	1	food, utilitarian
rigid spine flower	*Chorizanthe rigida*	1	none

[1] Number of identified specimens
[2] Based on Fowler (1986), Irwin (1980), Steward (1941), and Zigmond (1981)

As discussed above, a seed from an Old World date palm was recovered from Feature 2 in Shelter B. Date palms are presently abundant at Furnace Creek Ranch, but little information is available about when the first palms were brought to Death Valley. Date palms were first introduced to Furnace Creek in 1921. The first fruit-producing Deglet Noor date trees were brought to the valley between 1924 and 1925. Gower (1970:141) stated that these trees produced fruit within one or two years. If the date pit from Shelter B was obtained in one of the Furnace Creek groves, then the minimum date for use of this shelter would be 1926 or 1927. It is also possible that dates were brought into Death Valley in earlier years as a dried commodity for the workers at the Harmony Borax Works or the occupants of Furnace Creek Ranch after the closure of the borax plant.

Seeds of native plants.—Mesquite (*Prosopis glandulosa*) was the most common seed recovered from either of the two storage features (Table 3). Pods were less common than seeds, perhaps the result of differential preservation in favor of the harder seeds. There was also evidence of bruchid beetle infestation, a small beetle that frequently inhabits mesquite fruits (Kingslover *et al.* 1977). Mesquite was of

particular importance to the Shoshone of Death Valley (Timbisha) as well as the Panamint Shoshone (Fowler 1995). Other archaeological evidence for storage of mesquite in either storage features or rock shelters in Death Valley was reported by Hunt (1960).

Table 3.—Vertical distribution of mesquite and piñon remains[1] by weight

Level (cm)	*Mesquite (gm)*		*Piñon (gm)*	
	feature 1	*feature 2*	*feature 1*	*feature 2*
0 - 10	8.33	2.41	15.30	0.34
10 - 20	12.07		8.25	—
20 - 30	4.59	4.89[2]	1.93	—
30 - 40	4.88	4.07	0.44	0.95
40 - 73	13.22	—	0.17	—
TOTALS	43.29	11.37	26.09	1.29

[1] Refers to whole seeds, hulls, and/or pods
[2] For 10-30 cm interval

Piñon nuts were the second most commonly recovered seed type from both storage features. The hulls of piñon nuts were most frequent in the upper half of Feature 1 and least frequent in Feature 2 (Table 3). Piñon nuts were also a very important food resource for local populations (as well as in the Great Basin as a whole [see Fowler 1986]) and would have been available for harvest in the late summer/early fall months. The smaller numbers of pine nuts in Feature 2 is interesting in light of the abundant cultigen specimens recovered from the same feature. This may be the result of a sampling error or may be indicative of a behavioral shift to less dependence on piñon resulting from the adoption of horticultural practices.

Other seeds of aboriginal economic importance from the features include blazing star (*Mentzelia* sp.) and phacelia (*Phacelia* sp.), both of which occur in small numbers. The Kawaiisu ground the seeds of *Mentzelia* into a peanut butter-like paste (Zigmond 1981). The Koso Shoshone collected mentzelia stalks which were placed on large flat rocks and stomped to separate the seeds for easy collection (Irwin 1980).

HORTICULTURE IN DEATH VALLEY

According to Steward (1938), wild seeds were not planted nor tended by the Panamint Shoshoni, but cultigens were introduced to the area in the 1870s, and became increasingly important by the 1890s. As described by Steward (1938:89):

> The plants and pattern of cultivation seems to have been borrowed almost completely from neighboring Southern Paiute. Few Death Valley people had farms.... Before shovels were introduced, plain digging sticks were used for planting. Each species or variety was planted in a different row. Work, including irrigation, was performed by both sexes. Because of short winters, crops were planted in February and harvested in July.... Plots were family owned. This conformed to the principle of use ownership and con-

flicted with no native patterns. Plants, even those ready for harvest, were usually destroyed at the owner's death, as among Ash Meadows Southern Paiute, and the field lay fallow for a year or two, when any relative resumed cultivation.

Wallace (1980) has suggested that horticulture may have entered Death Valley earlier than the 1870s, being introduced to the Panamint Shoshoni by Mojave Indians as early as the 1840s. Wallace (1980) notes that a Furnace Creek informant of Driver (1937) stated that his grandfather visited the Colorado River Valley and returned with seeds of several domesticates. A Colorado River Valley connection is further supported by the similarity between the Mohave word for muskmelon (***kamito***) and the term used by the Death Valley Shoshoni (***kamitu***) (Wallace 1980).

Irrespective of the exact timing, it is clear that the adoption of horticultural techniques during the 19th century added variety to the diets of the people of Death Valley. Domesticated plants reported to have been cultivated by the Shoshoni include: corn, squashes, pumpkins, two types of beans, muskmelons (cantaloupe), watermelons, wheat, sunflowers, tomatoes, potatoes, grapes, and peaches (Nelson 1891; Coville 1892; Steward 1938, 1941). The greatest diversity of domesticates are reported to have been produced by small garden plots in Grapevine Canyon in northern Death Valley (Steward 1941). However, a Furnace Creek village informant remembered planting only corn, beans, and pumpkins (Driver 1937:65). Since watermelon, squash, beans, and muskmelon are all represented within Feature 2 at Breakfast Canyon, the variety of domesticated plants raised at Furnace Creek may have been greater than recalled by Driver's informant.

The occurrence of sorghum (also known as broom millet) in Feature 2 was unexpected as it is not usually considered among the major European-introduced cultigens in post-contact North America. Of the nearly 20 species of the genus *Sorghum*, only one is a native to the New World (Gould 1981). There is no clear record of cultivation of this grass by Native Americans in western North America with the exception of the Tarahumara Indians of northern Mexico, whose use of "millet" was very limited (Pennington 1983). The rare occurrence of sorghum at Breakfast Canyon may indicate experimentation with this grain rather than common use. Its presence does, however, underscore the presence of a wide range of cultigens available to and cultivated by the native peoples of Death Valley.

The location and types of gardens in Death Valley have been explicated to some degree in the ethnographic record. Established gardens were reported by the latter part of the 19th century at several localities in Death Valley in addition to Furnace Creek and Grapevine Canyon. These include Warm Springs, Saratoga Springs, and Hungry Bill's Ranch (Fowler 1995). Ditch irrigation was used with these plots which could reach an acre in size. For a more comprehensive discussion of Death Valley horticulture, see Wallace (1980) and Fowler (1995).

DISCUSSION

Archaeological storage features are fairly common to rockshelters in the region surrounding Death Valley (Clewlow, Wallmann, and Clewlow 1995; Hildebrand 1972; McCown 1964; Meighan 1953), and several possess characteris-

tics similar to those noted at CA-Iny-272.[2] At Coville Rockshelter, between Saline and Death Valleys, Meighan (1953) recorded six storage features, both grass- and slab-lined. Floral remains recovered from the rockshelter include piñon, desert peach (*Prunus andersonii* Gray), buckwheat (*Eriogonum* sp.), cactus (*Opuntia* sp.), and yucca (*Yucca* sp.). McCown (1964) reports on the discovery and excavation of storage features that contained fragments of newpapers dating to the 1870s in lava blisters approximately three miles south of Little Lake in Rose Valley. One storage feature in "Lava Cave 1" contained piñon nuts and acorns (*Quercus* sp.). Hildebrand (1972) reports on the excavation of four rock-lined cache pits at Chapman Shelter 1 in the Coso Range, where piñon (*Pinus* sp.) hulls were found in two of the pits. Resurrection Shelter (CA-Iny-2844), originally recorded by the author in 1985, produced a remarkable rock-lined storage pit during excavations by Clewlow, Wallmann, and Clewlow (1995). This feature was very similar to Feature 1 at Breakfast Canyon in terms of its size, construction, and artifact assemblage. A paleobotanical analysis by Gummerman and Klug (1995) from this feature included the identification of blazing star (*Mentzelia* sp.), sage (*Salvia* sp.), wolfberry (*Lycium cooperi* Gray), mormon tea (*Ephedra* sp.), needlegrass (*Stipa* sp.), and Indian rice grass (*Oryzopsis hymenoides* [R. & S.] Ricker).

Several of the native species of economic value noted above, with the exception of mesquite,[3] were also encountered in small numbers at CA-Iny-272. *Mentzelia* also has been recovered from archaeological deposits in open air sites in Coso Mountains, Rose Valley, and Owens Valley (Bettinger 1989; Gummerman and Klug 1995).[4] Cultigens, however, have proved to be far rarer in occurrence. McCown (1964) reports discovering a "small corn cob" in a storage pit within a lava blister just south of Rose Valley, approximately 110 km west of Death Valley.[5] In 1955, William Wallace recovered a corn meal sack, a sown pocket from a man's coat, and two coffee cans full of seeds cached in a rock crevice in Butte Valley, an offshoot of southern Death Valley (approximately 80 km south of Breakfast Canyon). The coffee tins and cloth packets contained seeds of cantaloupe, squashes (*Cucurbita mixta* Pang., *C. maxima*, and *C. pepo*), citron, and the native tansy mustard (*Descurania pinnata* [Walt.]) (W. Wallace, personal communication, 1995). Also found with this material were five small ears of maize identified as belonging to the "Mais Blando race of northern Mexico" or "the Pima-Papago race" (W. Wallace, personal communication, 1995 [*per* H. C. Cutler]). Several kernels of maize also found in the cache were described as a late prehistoric corn common to the Southwest after A.D. 1100 (W. Wallace, personal communication, 1995).

The location of the Breakfast Canyon storage features and their contents may have both significant land-use and seasonal implications. All of the seeds known to have been stored in the features are late summer/early fall resources. Most probably are from areas west of the shelters. The closest large groves of piñon pine trees are currently 16-25 km west of the site in the Panamint Range. Honey mesquite trees are found today within one mile west of the site. Evidence of storage of these resources on the eastern side of the valley suggests that this area may have been a focal point of subsistence activities (i.e., use of stored foods) during the lean winter months, an hypothesis supported by the local ethnographic data.

Steward (1938) reported a small winter village at Furnace Creek (***Tümbica***)

prior to the founding of the borax works in the 1880s. Following the establishment of Furnace Creek Ranch, Shoshoni from other areas wintered near the resort and moved to other areas during the summer (Steward 1938:92). Steward further noted that most subsistence activities were focused in the Panamint Range, with summer camps located at Wildrose Spring, Blackwater Spring, and the head of Death Valley Canyon. It is probable that prior to the Euroamerican appearance in the valley, summer (seed gathering) and fall (piñon) camps were in the Panamints, perhaps with brief summer excursions to Furnace Creek to collect mesquite pods.[6] Some mesquite may have been cached in some of the closest rockshelters to the Furnace Creek groves, which would have included CA-Iny-272. Piñon nuts would have also been added to the storage features as people moved from piñon camps in the late fall to the winter village at Furnace Creek. With the appearance of horticulture in the region in the mid- to late-nineteenth century, seeds from the fall harvest of domesticated plants may have been stored with the cached foods (as seen in Shelter B) for the following year's planting. Driver (1937:65) noted that at Furnace Creek, Timbisha Shoshoni would store surplus corn, wheat, and squash in pits, but would also save seeds for planting the following year. The nature of the cultigen remains from Breakfast Canyon, consisting predominantly of seeds rather than dried fruit flesh, would suggest seed storage rather than the caching of the domesticates as foodstuffs.

The rockshelters in Breakfast Canyon have yielded the first detailed archaeological data confirming the ethnographic/ethnohistoric record of aboriginal cultigen production in Death Valley. These data tend to support the notion that horticulture was introduced in the later half of the nineteenth century. Horticulture may have diffused from both the east and the south, coming to the Shoshoni in Death Valley from the Southern Paiute in southwestern Nevada and perhaps the Mohave from the Colorado River area. Although there is some suggestion that the Owens Valley Paiute practiced incipient agriculture using two indigenous crops (yellow grass nut [*Cyperus esculentus* L.] and wild-hyacinth [*Dichelostemma pulchella* Salisb.]) (Lawton *et al.* 1976), there is no indication from the ethnographic record or historical accounts that introduced cultigens were planted and harvested by these people. In Death Valley, seeds from the late summer/early fall harvest appear to have been stored with traditional food items (piñon, mesquite pods) for use the following year. As noted by Fowler (1995), the addition of garden horticulture to the typical Mojavean foraging strategy produced a subsistence system that would benefit it practitioners during those periods when traditional resources may have been in short supply. It also would have served to add markedly to the variety of foods items available to the Timbisha.

Much remains to be learned about the exact timing of the horticultural incursion into Death Valley. It is hoped that future archaeological investigators will develop research strategies that will focus on this important issue, since the answers to many questions are likely to exist in one or several of the countless rockshelters and caves that populate the numerous canyons in the ranges that encompass Death Valley.

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NOTES

[1]The actual, unadjusted dates for these samples is 10±70 (Beta-54375) and 180±60 (Beta-54376). The dates in the text have been adjusted for $^{13}C/^{12}C$, but because of recent variations in atmospheric ^{14}C known as the post-Sixteenth century de Vries effects, the assignment of a calendar date can be problematic (see Taylor 1987:35-38). The calibrated age range for the 340±60 rcy BP date is A.D. 1440-1665. The "modern" sample (Beta-54375), however, is calibrated to (at 2 sigma) A.D. 1690-1735, or 1815-1925 (D. Hood, personal communication, 1997). Most importantly for the issues discussed in this paper, the upper sample (based on these two individual measurements) dates to a later time than the lower component of the storage feature.

[2]For a comprehensive discussion of rock-lined storage features in the Great Basin and Southwest, see Wilke and McDonald 1989.

[3]Mesquite remains, especially from caches, have been uncommonly recovered from archaeological sites in the Mojave Desert and surrounding areas. Hunt (1960) reports a mesquite cache in two separate storage features in Death Valley, one near Bennett Wells, the other between Tule Springs and Shorty's Well. At China Ranch south of Death Valley a small, mud-lined pit in Robinson Cave (CA-Iny-982) contained both honey and screwbean mesquite (*Prosopis glandulosa* and *P. pubescens*) (Schroth 1987). Chuckwalla Cave in the Moapa Valley of Nevada also yielded caches of both mesquite species from rock crevices (Shutler 1961). Further south, in the Mecca Hills of the Salton Basin of California, Swenson (1984) describes a cache of *P. glandulosa* from an *olla* discovered in a crevice.

[4]Other indigenous floral species of aboriginal economic significance noted in the above storage features have been recovered from several open air sites in this region. An interesting exception is the fairly common occurrence of seeds of the tansy mustard (*Descurania pinnata* [Walt.]) (Gummerman and Klug 1995) in flotation samples from sites in the Coso region west of Death Valley.

[5]Also found in this storage feature were grain sacks containing "four oat seeds and three barley kernels" (McCown 1964:6). It is assumed that these grains were not intentionally

stored in the features, but were mere remnants inadvertently left in the bottom of the grain sacks stored here. Approximatley 20 grain sacks were recovered from this storage pit, along with numerous pieces of Euroamerican textiles.

[6]According to Fowler (1995), the Timbisha Shoshone of Death Valley also used mesquite earlier in the season, beginning in spring when the pods were green and flat. The pods were roasted over hot stones in a pit. The final product of this process was tart and not enjoyed by everyone (Fowler 1995:102).

LITERATURE CITED

BETTINGER, R. L., 1989. The archaeology of Pinyon House, Two Eagles, and Crater Middens: Three Residential Sites in Owens Valley, Eastern California. Anthropological Papers of the American Museum of Natural History No. 67, New York.

CLEWLOW, C. W., JR., STEVEN WALLMANN, and THERESA CLEWLOW. 1995. Archaeological test excavations at sites CA-Iny-2844, CA-Iny-2845, and CA-Iny-2847, Inyo County, California. Technical Publication 8264, Naval Air Warfare Center Weapons Division, Naval Air Weapons Station, China Lake, California.

COVILLE, FREDERICK VERNON. 1892. The Panamint Indians of California. American Anthropologist (old series) 5(4):351-362.

DRIVER, HAROLD E. 1937. Culture element distributions, VI: Southern Sierra Nevada. University of California Anthropological Records 1(2).

FOWLER, CATHERINE S. 1986. Subsistence. Pp. 64-97 *in* Handbook of North American Indians, Volume 11 (Great Basin). William C. Sturtevant (general editor), Warren L. d'Azevedo (volume editor). Smithsonian Institution, Washington, D. C.

———. 1995. Some notes on ethnographic subsistence systems in Mojavean environments in the Great Basin. Journal of Ethnobiology 15(1):99-117.

GOULD, FRANK W. 1981. Grasses of southwestern United States. The University of Arizona Press. Tucson, Arizona.

GOWER, H. P. 1970. Fifty years in Death Valley: Memoirs of a borax man. Publication No. 9 by the Death Valley '49ers. Inland Printing and Engraving Company, San Bernardino, California.

GUMMERMAN, GEORGE, IV, and LISA KLUG. 1995. 1992 paleoethnobotanical analysis of soil samples from CA-Iny-2844, and Iny-2845, Inyo County, California. Pp. 287-311 *in* Archaeological test excavations at sites CA-Iny-2844, CA-Iny-2845, and CA-Iny-2847, Inyo County, California, C.W. Clewlow, Jr., Steven Wallmann, and Theresa Clewlow. Technical Publication 8264, Naval Air Warfare Center Weapons Division, Naval Air Weapons Station, China Lake, California.

HILLEBRAND, TIMOTHY S. 1972. The archaeology of the Coso locality of the northern Mojave region of California. Ph.D. dissertation, University of California, Santa Barbara.

HUNT, ALICE P. 1960. Archaeology of the Death Valley salt pan, California. University of Utah Anthropological Papers No. 47. Salt Lake City.

IRWIN, CHARLES (editor). 1980. The Shoshone Indians of Inyo County, California: The Kerr Manuscript. Ballena Press Publications in Archaeology, Ethnology, and History 15. Soccoro, New Mexico.

KINGSLOVER, J. M., C.D. JOHNSON, S. R. SWIER, and A. L. TERAN. 1977. *Prosopis* fruits as a resource for invertebrates. Pp. 108-122 *in* Mesquite: Its biology in two desert scrub ecosystems, B. B. Simpson (editor). Dowden, Hutchison, and Ross, Stroudsburg, Pennsylvania.

LAWTON, HARRY W., PHILIP J. WILKE, M. DEDECKER, and W. M. MASON. 1976. Agriculture among the Paiute of Owens Valley. Journal of California Anthropology 3(1):13-50.

McCOWN, BENJAMIN E. 1964. Survey of lava field in Inyo County, California. Pp. 1-14 *in* Collected papers of Benjamin Ernest McCown. Archaeological Survey Association of Southern California Papers No. 6, Bloomington, California.

MEIGHAN, CLEMENT. W. 1953. The Colville rockshelter, Inyo County, California. University of California Anthropological Records 12(5).

NELSON, EDWARD W. 1891. The Panamint and Saline (Col.) Indians. American Anthropologist (old series) 4:371-372.

NORRIS, LARRY L. n.d. A checklist of the vascular plants of Death Valley National Monument. Death Valley National History Association. Death Valley, California.

PENNINGTON, CAMPBELL W. 1983. Tarahumara. Pp. 276-289 *in* Handbook of North American Indians, Volume 10 (Southwest). William C. Sturtevant (general editor), Olfonzo Ortiz (volume editor). Smithsonian Institution, Washington, D.C.

PUSEMAN, KATHRYN, and LINDA SCOTT-CUMMINGS. 1996. Identification of macrofloral remains from the Breakfast Canyon shelters, site CA-Iny-272, Death Valley, California. Appendix 3 *in* Archaeological investigations at the Breakfast Canyon Rockshelters, Death Valley National Monument, Inyo County, California: Shoshoni food storage and horticulture in the southwestern Great Basin, Robert M. Yohe II and Sharynn Valdez. California State University Museum of Anthropology Occasional Papers No. 6., Bakersfield.

SCHROTH, ADELLA. 1987. The use of mesquite in the Great Basin. Pp. 53-78 *in* Papers on the Archaeology of the Mojave Desert, Mark Q. Sutton (editor). Coyote Press Archives of California Prehistory 10. Salinas, California.

SHUTLER, RICHARD JR. 1961. Lost City: Pueblo Grande de Nevada. Nevada State Museum Anthropology Papers 5. Carson City.

STEWARD, JULIAN H. 1938. Basin-Plateau aboriginal sociopolitical groups. Bureau of American Ethnology Bulletin 120.

———. 1941. Culture element distributions: XIII, Nevada Shoshone. University of California Anthropological Records 4(2).

SWENSON, JAMES D. 1984. A cache of mesquite beans from the Mecca Hills, Salton Basin, California. Journal of California and Great Basin Anthropology 6(2):246-252.

TAYLOR, R. E. 1987. Radiocarbon dating: An archaeological perspective. Academic Press, Orlando, Florida.

WALLACE, WILLIAM J. 1980. Death Valley Indian farming. Journal of California and Great Basin Anthropology 2(2):269-272.

WILKE, PHILIP J. and MEG McDONALD. 1989. Prehistoric use of rock-lined cache pits: California deserts and the Southwest. Journal of California and Great Basin Anthropology 11(1):50-73.

YOHE, ROBERT M., II and SHARYNN-MARIE VALDEZ. 1996. Archaeological investigations at the Breakfast Canyon Rockshelters, Death Valley National Monument, Inyo County, California: Shoshoni food storage and horticulture in the southwestern Great Basin. California State University Museum of Anthropology Occasional Papers No. 5. Bakersfield.

ZIGMOND, MAURICE L. 1981. Kawaiisu ethnobotany. University of Utah Press, Salt Lake City.